< Psychological Determinants of Long-Term Vaccination Intention Against COVID-19: the Role of Conspiracy Beliefs >

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Abstract

This study tried to predict people's intention to vaccinate once or twice a year in the coming three years, focusing on conspiracy beliefs concerning corona (CBc), exposure to social media, broader exposure to mainstream media versus alternatives, and ten social cognitive determinants including fear, self-efficacy, and moral norm. An online survey was conducted based on snowball sampling mainly in mainland China to recruit Chinese adults through an online advertisement posted on social media. Bivariate correlations and mediation analyses were conducted to test five hypothetical models. Results identified the moral norm as the mediator of both the positive relationship between CBc and long-term vaccination intention and the negative relationship between social media exposure and long-term vaccination intention. This is not only a core replication but also an extension of an earlier mediation model in which social duty mediated the negative relationship between CBc and one-time vaccination intention. Suggestions to combat CBc are debunking and prebunking methods. Meanwhile, by raising people's perceived moral norm of vaccination, authorities can motivate more people to vaccinate through public communication on the mass media to gain more control against the pandemic.

Keywords: conspiracy beliefs concerning corona (CBc), exposure to media, social cognitive determinants, moral norm, long-term vaccination intention.

Introduction

Governments have been encouraging people to make booster vaccination since the emergence of Omicron because the protective effect of basic two shots is still not permanent. Right from the start, authorities have emphasized herd immunity to end the COVID-19 pandemic. Herd immunity is indirect protection from an infectious disease, which happens when a population is immune either through vaccination or infection (World Health Organization [WHO], 2020c). Given the high transmissibility of the coronavirus SARS-CoV-2 and a goal to achieve herd immunity that needs at least 60-70% of the population immune, vaccination is a relatively more scientific and effective strategy rather than natural infection because of its time- and life-saving advantages (WHO, 2020b). With vaccines, we can forwardly take actions to get the majority of people vaccinated, and safely train our immune system without making us ill, instead of letting the virus spread within and take lives away.

Over the past years of fighting the pandemic, an argument rises on whether the COVID-19 herd immunity is still possible, while on the other hand, a call for a normal life, for a more realistic way in which we can live "with the virus" (D'Souza & Dowdy, 2021; Aschwanden, 2021; Steenhuysen, 2022). For this want, the importance of vaccines is more appealing, mainly because they have been proven effective at preventing severe diseases due to the virus (Andrews et al., 2022; Feikin et al., 2022). As long as we can vaccinate vulnerable individuals, we can reduce hospitalization and death cases to manage the pandemic's impact, while reaching a level of population immunity. By the argument, a possibility is unfolding that people probably need to get vaccinated regularly in the coming years. While from a medical point of view, vaccination can be effective for public health against the pandemic, from a psychological point of view it is also imaginable that not all people are willing to get vaccinated, let alone the long-term context. This sparks interest in what might influence individuals to get vaccinated regularly against COVID-19 in a long run.

Recent research increasingly pays attention to an appealing factor relevant to COVID-19 vaccination: *conspiracy beliefs concerning the coronavirus* (*CBc*; Dijkstra, 2021). Generally, conspiracy theories are explanations for major events with claims of secret plots led by one or a few powerful actors, and conspiracy beliefs are the manifestation of corresponding conspiracy theories (Douglas et al., 2019). Therefore, CBc specifically refer to beliefs in one or a set of conspiracy theories concerning the virus. A comprehensive review (van Mulukom et al., 2022) systematically classified such conspiracy theories into four categories that were what, how, who, and why regarding the pandemic. For example, a claim that the virus was created and deliberately spread by America, or another that the virus was a laboratory bioweapon released by China ("COVID-19 misinformation", 2022). To clarify, initial field research on the origin of the coronavirus reported it as natural, and no evidence indicating that the virus was released from a lab (WHO, 2020a).

Although contents are different, there is evidence that CBc might be detrimental to their followers' health by triggering coronavirus-related behavioural changes. Recent studies suggested that people's endorsement of CBc could lower their engagement in prevention behaviours (e.g., hygiene, social distancing, and wearing facial masks), detection behaviours (i.e., getting tested), as well as vaccination (van Mulukom et al., 2022; van Prooijen et al., 2021a; van Prooijen et al., 2021b; Dijkstra, 2021). Especially about vaccination, multiple social cognitive determinants derived from typical theories were found to be mediators (van Prooijen et al., 2021a; Dijkstra, 2021) through which CBc passively shape people's understanding of their surroundings and health recommendations from authorities such as governments and healthcare specialists.

The Extended Parallel Process Model (EPPM; Witte, 1992) is a framework of fear appeal to health messages to explain why some people accept external health messages and try to control threats, while some reject and defend themselves from fear. The extent individuals

perceive susceptibility, severity, and self-efficacy which are core components of health messages displayed will affect their fear arousal and in turn, influence their decision-making to take action. Only with high susceptibility, severity, and efficacy, people will proceed to the threat-control process (Peters et al., 2013), for example, to vaccinate. Therefore, seeing the coronavirus as a health threat of infection and related illness, individual *susceptibility*, perceived *severity*, *self-efficacy*, and *fear of COVID-19* are introduced as four positive determinants of vaccination (Al-Amer et al., 2021; Kazeminia et al., 2022; Dijkstra, 2021). Moreover, *fear of healthcare* and *fear of needles* (McLenon & Rogers, 2019) are also introduced as potential barriers to getting vaccinated. Fear of healthcare is a broad fear that includes several specific fears relevant to the healthcare setting, such as fear of needles and fear of severe health problems (Svirbely, 2020). Thus, it is supposed that a high level of such fears makes individuals unable to vaccinate.

Further inspired by the Theory of Planned Behaviour (TPB; Ajzen, 1991), people's intention toward a specific behaviour can be predicted by their attitudes, subjective norms, and perceived behavioural control toward the behaviour. In the pandemic context, people's knowledge of vaccines' protective effects and side-effects affects their attitudes towards vaccination. Therefore, *the effectiveness of vaccines* as a positive determinant (Al-Amer et al., 2021; Dijkstra, 2021) and *the seriousness of side-effects* as a negative determinant (Wang et al., 2021; Kazeminia et al., 2022) are introduced. Those who believe vaccines are protective and their side-effects are relatively less serious are more likely to get vaccinated. Meanwhile, social norms are also influential to people's vaccination intention. S*ubjective norm* as a positive determinant (Winter et al., 2021; Rogers et al., 2021) refers to the belief that an individual thinks people around them approve of and support a normative behaviour. Typically, pro-vaccination for example, or anti-vaccination conversely. *Moral norm* (Rivis et al., 2009) refers to the perceived social correctness of a specific behaviour, like a social duty

to get vaccinated, which also showed a positive influence congruent with the TPB (Wang et al., 2021; Dijkstra, 2021). A sense of positive social norm regarding vaccination is supposed to motivate people to get vaccinated.

Despite relating CBc and ten determinants with vaccination, recent research also emphasized the influence of media through which CBc are spread. While an underlying assumption of current theorizing is that people already endorse more or less CBc before they are exposed to the mass media where they react accordingly while reading corona-related messages that might stimulate the determinants mentioned, it is also plausible to think the other way around (Dijkstra, 2021). Given a notice on social media and mainstream media (Douglas et al., 2019; Bavel et al., 2020), greater exposure to digital media and personal contacts was related to higher endorsement of CBc, and on the other hand, greater exposure to mainstream media was related to lower endorsement of CBc (De Coninck et al., 2021). Furthermore, trust in and reliance on social media consistently predicted CBc, but distrust in mainstream media appeared to have greater prediction power (van Mulukom et al., 2022). Specifically, mainstream media refer to old and traditional media controlled by large organizations (Welsh & Wright, 2010), while others are alternatives. Therefore, in this study, people's *broader exposure to mainstream media* refers to that they are exposed to a greater number of information sources from mainstream media than from alternatives. Likely, people's *exposure to social media* refers to the number of social media platforms used. Combined, evidence suggested that the more people are exposed to information from mainstream media and use social media platforms, the more they believe in CBc.

Overall, the researcher comes up with five hypothetical mediation models of long-term vaccination. Firstly, in an attempt to replicate and expand previous findings (Dijkstra, 2021), relating CBc and the determinants, it was hypothesized that (a) endorsement of CBc is related negatively to long-term vaccination intention; (b) endorsement of CBc is related negatively to

susceptibility, severity, fear of COVID-19, self-efficacy, the effectiveness of vaccines, subjective norm, and moral norm, while it is related positively to fear of needles, fear of healthcare and the seriousness of side-effects; (c) the determinants have positive relationships with long-term vaccination intention, except for fear of needles, fear of healthcare, and the seriousness of side-effects that relate negatively; (d) the negative relationship between the endorsement of CBc and long-term vaccination intention is mediated by the determinants.

Secondly, relating social media and CBc, it is hypothesized that (e) people's exposure to social media is related positively to their endorsement of CBc but (f) negatively to long-term vaccination intention; (g) the negative relationship between exposure to social media and long-term vaccination intention is mediated by the endorsement of CBc.

Thirdly, relating mainstream media and CBc, it is hypothesized that (h) people's broader exposure to mainstream media is related negatively to their endorsement of CBc but (i) positively to long-term vaccination intention; (j) the positive relationship between broader exposure to mainstream media and long-term vaccination intention is mediated by the endorsement of CBc.

Fourthly, relating social media and the determinants, it is hypothesized that (k) people's exposure to social media is related negatively to susceptibility, severity, fear of COVID-19, self-efficacy, the effectiveness of vaccines, subjective norm, and moral norm, while it is related positively to fear of needles, fear of healthcare, and the seriousness of side-effects; (l) the negative relationship between exposure to social media and long-term vaccination intention is mediated by the determinants.

Fifthly, relating mainstream media and the determinants, it is hypothesized that (m) people's broader exposure to mainstream media is related positively to susceptibility, severity, fear of COVID-19, self-efficacy, the effectiveness of vaccines, subjective norm, and moral norm, while it is related negatively to fear of needles, fear of healthcare, and the

seriousness of side-effects; (n) the positive relationship between broader exposure to mainstream media and long-term vaccination intention is mediated by the determinants.

Method

Participant and procedure

An online Qualtrics survey (See Appendix A for its three language versions) was conducted based on snowball sampling in mainland China, Hong Kong, Macau, and Taiwan. Chinese adults above 18 years old were recruited through an online advertisement posted by the researcher on WeChat and WhatsApp. According to a statistical guideline of the sample size to examine relationships (Wilson Van Voorhis & Morgan, 2007), about 200 participants are plausible, concerning the number of variables and practical limitations such as budget and time as well.

At the beginning of the survey, participants were provided with research information including legal issues and data storage and then asked for informed consent. Subsequently, participants proceeded to respond to the survey questions. At the end of the survey, the researcher provided a fact check on conspiracy statements for participants. After the research realization, the researcher thanked participants with a lottery through random selection for three lucky ones and compensated them with electronic gift cards distributed by email. This study design was approved by the Psychology Ethics Committee of the University of Groningen.

Measurement

Background information

The survey started by collecting participants' demographics on *age*, *sex*, *location*, and *educational levels* as well as their job experience in the healthcare sector. Then additionally, their personal experience about the pandemic that were their self-perception of infection, test history, perceived infection in close others, and vaccination history.

Educational levels were rated with the question "What is your highest educational level that you have achieved?" with its answering options that were "Less than high school", "High school", "Bachelor's degree or equivalent", "Master's degree or equivalent", and "Doctor's degree or equivalent". The options were recoded into three categories that were (1) lower, (2) general (i.e., a bachelor's degree or equivalent), and (3) higher. Reasons for such recoding were referred to Appendix B.

Job experience in healthcare was surveyed with the question "Do you have experience working in the health care sector?" with its options that were "Yes, presently" and "Yes, in the past" recoded as (1) yes, and (0) "No".

Exposure to the mass media

Exposure to the mass media was measured separately by participants' exposure to social media and mainstream media. Note that based on different regions, options for each question were derived and presented accordingly. A detailed explanation of research for the options is referred to Appendix C.

Exposure to social media was assessed through the question "Through which social media platforms do you usually get information about COVID-19-related issues (e.g., the viruses, the current situation, people's opinions, hospitals' measurements, government measurements) from the mass media?". Except for two additional options "not included" and "not sure", ten options were presented for participants from mainland China, while eleven options for those from Hong Kong, Macao, and Taiwan. A higher score on the number of platforms indicates greater exposure to social media.

Broader exposure to mainstream media was assessed through the question "From which sources do you usually get information about COVID-19-related issues (e.g., viruses, the current situation, people's opinions, hospitals' measurements, government measurements)?" Except for two additional options "not included" and "not sure", eleven

options were presented for participants from mainland China, twenty-nine for those from

Hong Kong, twenty-eight for those from Macao, and twenty-nine for those from Taiwan. A

positive score on the difference between the numbers of information sources either from

mainstream media or alternatives indicates broader exposure to mainstream media.

Conspiracy beliefs concerning corona (CBc)

The endorsement of CBc was indicated by the mean of ratings on agreement toward ten

conspiratorial statements randomly ordered, with a 7-point scale from (1) "Strongly disagree"

to (7) "Strongly agree". The ten statements were fundamentally derived from previous studies

(van Mulukom et al., 2020; Dijkstra, 2021; van Prooijen et al., 2021a), information publicly

available online (European Commission, n.d.), and the researcher's observation. For example,

the first statement is "The National Health Commission of China provides misinformation

about COVID-19 to the public".

Social cognitive determinants

Susceptibility was assessed by the item "How high is the chance do you think that you will

get ill from the COVID-19 viruses in the next three years?", while participants were asked to

present percentages as answers with a slide bar. *Severity* was rated with the item "How bad is

it do you think to get ill because of the COVID-19 viruses in the next three years?" on a 5-

point scale from (0) "Not bad at all", (1) "A little bad", (2) "Just bad", (3) "Very bad", to (4)

"Awfully bad".

Fear of COVID-19 was rated with the item "Do you feel afraid to get ill because of the

COVID-19 viruses in the next three years?" on a 7-point scale from (0) "Never", (1)

"Seldom", (2) "Sometimes", (3) "Regularly", (4) "Often", (5) "Very often", to (6) "Always".

Fear of needles was rated with the item "How much do you dislike about needles or getting

injected in general?" on a 5-point scale from (0) "Not at all", (1) "A little dislike", (2) "Just

dislike", (3) "Very dislike", to (4) "Awfully dislike". *Fear of healthcare* was rated with the

question "How much do you dislike about seeking help in health care in general?" on the same 5-point scale.

Self-efficacy was indicated by the mean of ratings on disinfection and vaccination. Participants' self-efficacy of disinfection was rated with the item "Are you able to exert influence yourself on whether you will get contaminated due to the COVID-19 viruses in the next three years?" on a 5-point scale from (0) "I have not influence at all", (1) "I have little influence", (2) "I do have some influence", (3) "I have substantial influence", to (4) "I can influence it myself completely". Subsequently, self-efficacy of vaccination was counter-rated with the item "How easy or difficult for you to get vaccinated in practice in the next three years?" on a 5-point scale from (0) "Very easy" to (4) "Very difficult".

The effectiveness of vaccines was assessed by the item "In the next three years, in how many of 100 people do you think will the vaccination protect against the COVID-19 viruses from getting contaminated, hospitalized, and from death?" while participants were asked to separately present three percentages answering each aspect with three slide bars. The mean of each participant's three percentages is an indicator of the effectiveness. *The seriousness of side-effects* was rated with the item "How serious do you think the side effects of COVID-19 vaccines could be in the next three years?" on a 5-point scale from (0) "Very slight" to (4) "Very serious".

Subjective norm was rated with the item "Do people around you think that you should get vaccinated in the next three years?" on a 5-point scale from (0) "Definitely not" to (4) "Definitely". *Moral norm* was rated with the item "Do you think it is your social duty to get vaccinated in the next three years?" on a 5-point scale from (0) "Strongly disagree" to (4) "Strongly agree". Note that items of susceptibility, severity, self-efficacy of disinfection, the effectiveness of vaccines, and moral norm were inspired by related measures of Dijkstra (2021).

Long-term vaccination intention

Participants' long-term vaccination intention was measured in a combination with their expected outcomes of future action. The mean of both measurements was supposed to indicate a more comprehensive intention.

Intention to vaccinate was rated with the question "To what extent do you intend to get vaccinated once or twice a year against the COVID-19 pandemic in the next three years?" on a 5-point scale from (0) "Not at all" to (4) "Very strongly". *Future action* was rated with the question "How certain are you that you will actually get vaccinated once or twice a year against the COVID-19 pandemic in the next three years?" on a 5-point scale from (0) "Certainly not" to (4) "Certainly".

Data analyses

Note that because variables of participants' personal experience about the pandemic are not relevant to current hypotheses, so they were excluded from the data analytical plan for this study. The researcher first inspected descriptives including bivariate correlations of variables, and then used Haye's PROCESS model 4 to make mediation analyses to test the five hypothetical models.

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Results

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Descriptives

Raw data were available from 267 participants, but after an exclusion (details refer to Appendix B), 142 participants were kept in the final dataset. Table 1 at the end of the paper presented an overview of descriptive results from preliminary analyses.

Among 142 participants, 58 (40.8%) were male and 84 (59.2%) were female. Due to 6 participants having invalid answers on age, their average age was 25.88 ($N = 136$, $SD = 3.61$) ranging from 18 to 42. Regarding location, 127 (89.4%) of them were from mainland China, while 9 were from Hong Kong, 3 from Macao, and 3 from Taiwan. Most of them (93.66%)

were at a general or higher educational level ($M = 2.28$, $SD = .58$). The majority of them (71.83%) did not have job experience in the healthcare sector ($M = .28$, $SD = .45$).

As for their exposure to the mass media, having two social media platforms (43.66%) was the most common, indicating participants' exposure to social media ($M = 2.25$, $SD = 1.26$). Compared to alternatives, most participants (66.90%) consumed more information sources from mainstream media, indicating their generally broader exposure to mainstream media ($M = 1.23$, $SD = 1.41$). With regard to conspiracy, participants had commonly low endorsement of CBc ($M = 2.65$, $SD = .96$).

In the three-year-future context, participants perceived low susceptibility on percentages ($M = 24.85$, $SD = 27.01$), low severity of getting ill ($M = 1.76$, $SD = 1.07$), mild fear of COVID-19 ($M = 1.53$, $SD = 1.35$), little fear of needles ($M = .78$, $SD = .96$), little fear of healthcare ($M = .49$, $SD = .69$), certain self-efficacy ($M = 2.66$, $SD = .71$). Furthermore, they perceived the effectiveness of vaccines on percentages as more than 65% overall ($M = 66.75$, $SD = 26.63$), and slight seriousness of vaccines' side-effects ($M = .62$, $SD = .97$). They also had a relatively strong perception of subjective norm ($M = 3.33$, $SD = 1.13$) and moral norm ($M = 3.27$, $SD = 1.20$). Lastly, they commonly intended to vaccinate once or twice a year ($M = 2.87$, $SD = 1.27$).

Inspecting the correlation matrix, background variables were more or less significantly correlated to several social cognitive determinants including CBc with small effect sizes ($|r|$ values $< .30$, p-values $< .05$). Particularly, job experience in the healthcare sector was significantly and positively correlated to self-efficacy ($r = .20$ $p < .05$). Results about the two media variables showed only two significant relationships both with small effects: the number of social media platforms, which indicates exposure to social media, was positively correlated to the effectiveness of vaccines ($r = .21 < .30$, $p < .05$); but the difference of the numbers of information sources from mainstream versus alternatives, which indicates broader

exposure to mainstream media, was negatively correlated to susceptibility ($r = -.21 > -.30$, p

$< .05$).

Concerning CBc, it was significantly and negatively correlated to age ($r = -.26 > -.30$, p

$< .01$), sex ($r = -.20 > -.30$, $p < .05$), moral norm ($r = -.26 > -.30$, $p < .01$), and long-term

vaccination intention ($r = -.18 > -.30$, $p < .05$) with small effects. Conversely, CBc was

significantly and positively correlated to susceptibility ($r = .25 < .30$, $p < .01$), fear of needles

($r = .20 < .30$, $p < .05$), and fear of healthcare ($r = .18 < .30$, $p < .05$) with small effects, while

similarly correlated to the seriousness of side-effects ($r = .35 < .50$, $p < .01$) with a medium

effect.

As for long-term vaccination intention, it not only correlated with CBc but also with

several social cognitive determinants. It was significantly and negatively correlated to fear of

needles ($r = -.18 > -.30$, $p < .05$) and the seriousness of side-effects ($r = -.30$, $p < .01$) with

small effects, while it was significantly and positively correlated to self-efficacy ($r = .27$

$< .30$, $p < .01$), the effectiveness of vaccines ($r = .32 < .50$, $p < .01$), and subjective norm (r

$= .35 < .50$, $p < .01$) with small or medium effects. Importantly, the significant correlation

between long-term vaccination intention and moral norm ($r = .60 < 1.0$, $p < .01$) appeared

with a large effect.

Mediation Analyses

Assumption checks suggested that assumptions of mediation analyses were roughly met. A

detailed explanation is referred to Appendix B.

Figure 1 illustrated the results of the first hypothetical model using CBc as the

independent variable and social cognitive determinants as mediators to predict long-term

vaccination intention. Regressions on each determinant showed that CBc significantly and

positively predicted susceptibility ($.25$, $p < .01$, $CI = [.09, .41]$), fear of needles ($.20$, $p < .05$,

$CI = [.04, .37]$), fear of healthcare ($.18$, $p < .05$, $CI = [.01, .34]$), the seriousness of side-

effects (.35, $p < .001$, CI = [.20, .51]), while significantly and negatively predicted moral

norm (-.26, $p < .01$, CI = [-.42, -.10]). The multiple regression analysis significantly

explained 43.99% variance of long-term vaccination intention (R^2 = .44, F (11, 130) = 9.28, p

< .01), and suggested self-efficacy (.18, $p < .05$, CI = [.04, .31]) and moral norm (.46, p

< .001, CI = [.29, .64]) as positive predictors with significance. The mediation analysis

revealed a significant and negative total effect of CBc on long-term vaccination intention

(-.18, $p < .05$, CI = [-.34, -.01]), a non-significant direct effect (-.03, $p > .05$), and a

significant indirect effect (-.15, BootCI = [-.34, -.01]) through mediators explaining 85.56%

of the total effect. Importantly, moral norm (-.12, BootCI = [-.24, -.03]) was the only

significant mediator among all, while others were not.

Figure 1

The first model of the endorsement of CBc, social cognitive determinants, and long-term
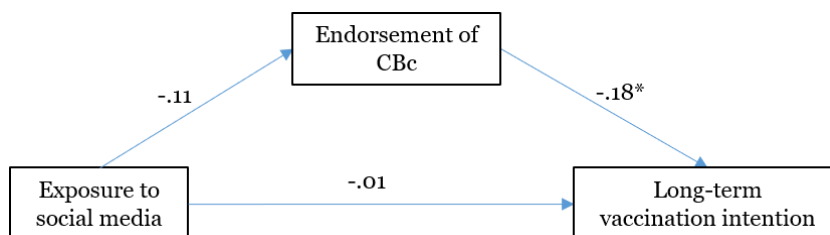
vaccination intention
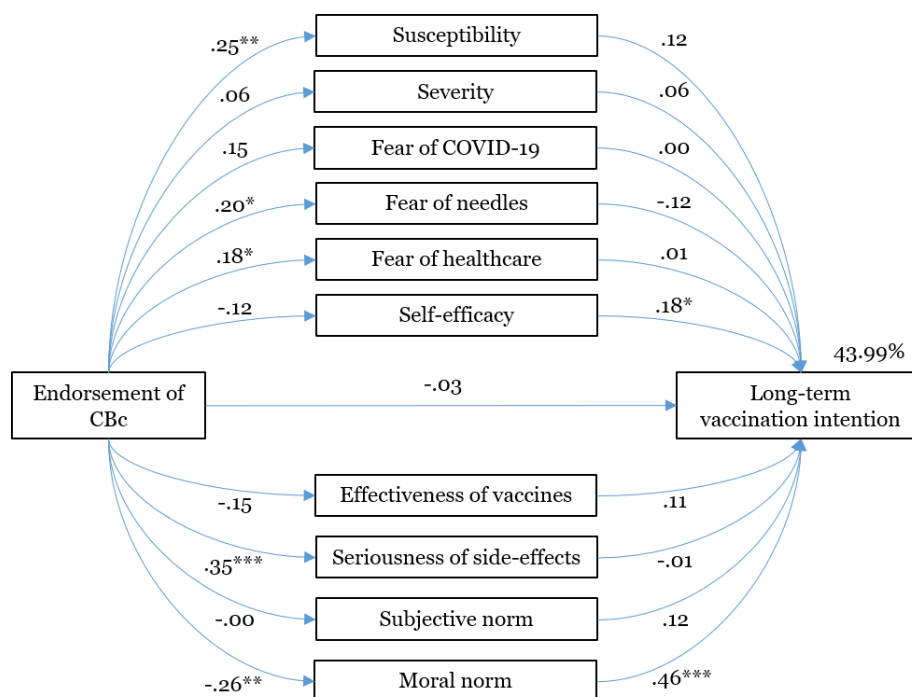
*Note. *p < .05. **p < .01. ***p < .001.*

Figure 2 and Figure 3 illustrated findings of the second and the third hypothetical models using either exposure to social media or broader exposure to mainstream media as the independent variable and CBc as a mediator to predict long-term vaccination intention. Regressions on CBc suggested no independent variables with prediction. Neither multiple regression of both models could significantly predict long-term vaccination intention (p-values > .05). Only the prediction of CBc on long-term vaccination intention kept the same as significantly negative as the total effect of CBc in the first model (-.18, p-values < .05). Likely, neither mediation analyses of both models showed significance neither on the total, direct or indirect effect of media because their confidence intervals included zeros.
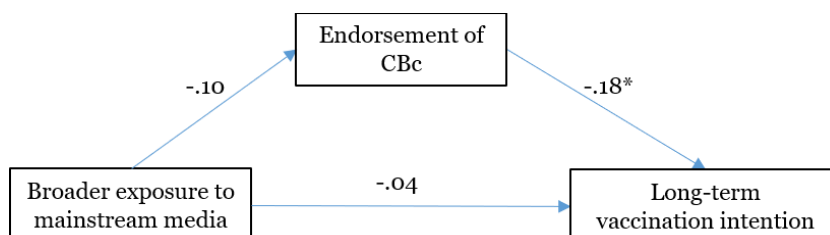
Figure 2

The second model of exposure to social media, the endorsement of CBc, and long-term vaccination intention

*Note. *p < .05.*

Figure 3

The third model of broader exposure to mainstream media, the endorsement of CBc, and long-term vaccination intention
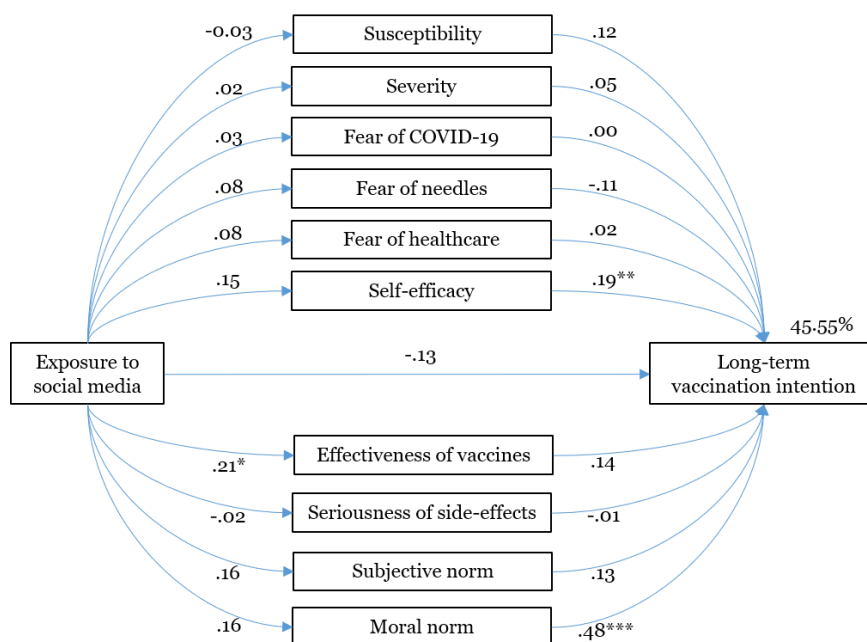

*Note. *p < .05.*

Figure 4 illustrated the results of the fourth hypothetical model using exposure to social media as the independent variable and social cognitive determinants as mediators to predict long-term vaccination intention. Regressions on each determinant showed that exposure to social media only significantly predicted the effectiveness of vaccines (.21, $p < .05$, $CI =$ [.05, .38]). The multiple regression analysis significantly explained 45.55% variance of long-term vaccination intention ($R^2 = .46$, $F (11, 130) = 9.88$, $p < .001$), and suggested self-efficacy (.19, $p < .01$, $CI = [.06, .33]$) and moral norm (.48, $p < .001$, $CI = [.31, .65]$) as positive predictors with significance. The mediation analysis revealed no significance on total and direct effects of exposure to social media on long-term vaccination intention (p-values $> .05$), but a significant and positive indirect effect (.15, BootCI = [.02, .27]) through mediators. Importantly, the moral norm (.08, BootCI = [.02, .17]) was the only significant mediator among all, while others were not.

Figure 4

The fourth model of exposure to social media, social cognitive determinants, and long-term vaccination intention
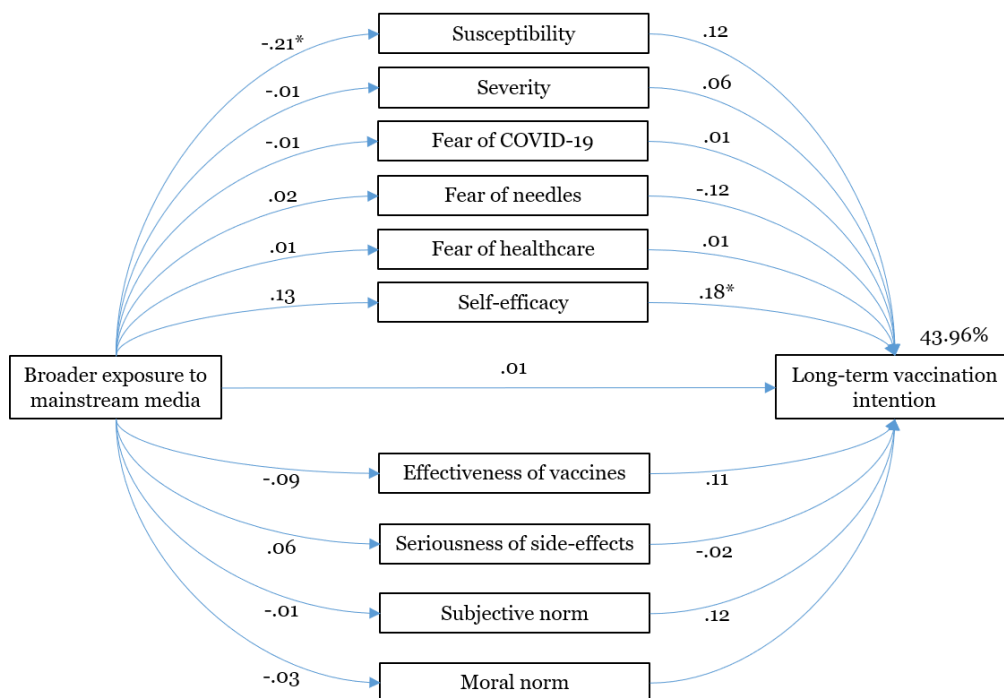

Note. *$p < .05$. **$p < .01$. ***$p < .001$.

Figure 5 illustrated the findings of the fifth hypothetical model using broader exposure to mainstream media as the independent variable and social cognitive determinants as mediators to predict long-term vaccination intention. Regressions on each determinant showed that broader exposure to mainstream media only significantly and negatively predicted susceptibility (-.21, $p < .05$, CI = [-.38, -.05]). The multiple regression analysis significantly explained 43.96% variance of long-term vaccination intention (R^2 = .44, F [11, 130] = 9.27, $p < .001$), and suggested self-efficacy (.18, $p < .05$, CI = [-.38, -.05]) and moral norm (.47, $p < .001$, CI = [.30, .64]) as positive predictors with significance. The mediation analysis revealed no significance in the total, direct and indirect effects of higher exposure to mainstream media on long-term vaccination intention because their CIs included zeros.

Figure 5

The fifth model of broader exposure to mainstream media, social cognitive determinants, and long-term vaccination intention

Note. $*p < .05$. $***p < .001$.

Discussion

The goal of this study is to identify social psychological factors that could influence people's long-term vaccination intention in the coming three years and to explore how those factors might affect the intention. In addition to topical factors that were conspiracy beliefs concerning corona (CBc), exposure to social media, and broader exposure to mainstream media versus alternatives, ten social cognitive determinants were identified. Among, susceptibility, severity, fear of COVID-19, self-efficacy, the effectiveness of vaccines, subjective norm, and moral norm were positive determinants of vaccination, while fear of needles, fear of healthcare, and the seriousness of side-effects were negative determinants. Key findings were obtained from bivariate correlations and mediation analyses to test five hypothetical mediation models.

The first model hypothesized people's endorsement of CBc as the independent variable and the determinants as mediators to predict their long-term vaccination intention. When participants agreed more with CBc, they felt more susceptible themselves, more fear of needles, more fear of healthcare, and more seriousness of COVID vaccines' side-effects, but sensed less moral norm and had lower intention to vaccinate once or twice in the next three years. Indeed, threat perception can predict CBc by raising people's fear and anxiety (van Mulukom et al., 2022). More about such long-term vaccination intention, when participants sensed less self-efficacy for disinfection and vaccination and less moral norm, they were less intended to vaccinate, which was replicated in the fourth and fifth models as well. Further, it was only the moral norm that bridged the passive impact of CBc on participants' long-term vaccination intention, as the same mediator found in the fourth model; this finding was discussed later. Therefore, hypothesis (a) is met but (b), (c), and (d) are partly met.

The second model hypothesized people's exposure to social media as the independent variable and their endorsement of CBc as a mediator to predict their long-term vaccination

intention. Participants' exposure to social media showed no relationship with either their endorsement of CBc or their long-term vaccination intention, and the mediation effect of CBc did not exist. Therefore, hypotheses (e), (f), and (g) are not met. A similar summary was made from the third model which hypothesized participants' broader exposure to mainstream media as the independent variable and CBc as a mediator to predict long-term vaccination intention. Therefore, hypotheses (h), (i), and (j) are also not met. Unlike previous findings (De Coninck et al., 2021; van Mulukom et al., 2022), the lack of relations might be due to different measurements. Regarding media, the number of platforms and information sources were rough indicators of participants' media exposure, instead of trust or distrust in and reliance on media. A different definition of mainstream media may also be another possible reason. Concerning conspiracy, different CBc statements studied might be responsible. Moreover, these might be indicative of a less conspiratorial information environment than when CBc was previously widely spread on social media (Bavel et al., 2020; van Mulukom et al., 2022).

The fourth model hypothesized people's exposure to social media as the independent variable and the determinants as mediators to predict their long-term vaccination intention. Contradictory to what was expected, if participants have greater exposure to social media, and the more effective protection they thought COVID vaccines would have in the next three years. This may suggest a pro-vaccine environment on social media promoting the vaccines' benefits. Like the first model, it was still only the moral norm through which CBc passively impacted participants' long-term vaccination intention; this finding was discussed later. Therefore, hypotheses (k) and (l) are partly met.

The fifth model hypothesized people's broader exposure to mainstream media as the independent variable and the determinants as mediators to predict long-term vaccination intention. Also contradictory to what was expected, the broader the exposure to mainstream

media, the more susceptible participants thought themselves in the next three years. This may

suggest a frightening environment in mainstream media spreading the threat of COVID-19.

Unlike the first and the fourth models about the determinants, no mediation was found in this

model, which is similar to the third model also about mainstream media. This may be another

hint relating to the different measurement of mainstream media. Therefore, hypotheses (m)

and (n) are not met.

Given that the moral norm as an important determinant mediated the negative

relationship between CBc and long-term vaccination intention based on the first model, with

robust statistical power, and also mediated the positive relationship between exposure to

social media and long-term vaccination intention based on the fourth model. Hence, it is not

only a core replication but also an extension of Dijkstra's (2021) mediation model in which

social duty mediated the negative relationship between CBc and one-time vaccination

intention. On one hand, this is consistent with a recent finding that people with more CBc

expressed more concerns about themselves than others and performed more self-centered

behaviour like hoarding (van Mulukom et al., 2022) so it makes sense that believing in CBc

reduces people's perceived moral norm of vaccination in this case. On the other hand, it may

be a logical consequence that greater exposure to social media in which its pro-vaccine

environment creates a certain social influence seemingly from others on individuals makes

people more prone to accept vaccination as a moral norm to protect the society.

An additional finding from correlations is that participants with job experience working

in the healthcare sector, previously or currently, had a relatively higher sense of self-efficacy

to deal with the coronavirus in the next three years. Indeed, healthcare workers with

specialized knowledge are reasonable to be more confident to avoid infection for example

than ordinary people. But such an experience was not related to long-term vaccination

intention, though higher self-efficacy predicted higher the intention in this study. This is also

consistent with recent findings that compared to the general population, healthcare workers had relatively lower acceptance or higher hesitancy on vaccination due to considerations including vaccine safety (Wang et al., 2021; Al-Amer et al., 2021) that match their professional background.

Some limitations of this study should be considered when interpreting the results. Firstly, a snowball sampling through the researcher's social network resulted in a selected sample that consisted of Chinese young adults mostly from mainland China and that was more female and well-educated. Participants' age and sex were negatively related to their endorsement of CBc, so it is not suggested to generalize key findings from this sample to the target population, but they may be more useful to Chinese young adults in mainland China as a more specific subpopulation. Secondly, there is space for improvement regarding the measurement of media exposure. To avoid an overlong survey, the researcher only utilized the number of social media platforms and information sources as an indicator. But in reality, it is only a horizontal aspect of people's media usage, while their time cost, for example, on a daily or weekly basis, is another more meaningful aspect in a vertical direction in research. Thus, future studies can try to combine both aspects to draw a more complete overview of a sample's media use. Thirdly, although no important mistakes were found in the English-Chinese translation, potential inaccurate translation of an item will contribute to more or less confusing or even incorrect meaning of participants' answers on it which should stimulate a desired psychological construct. Fourthly, this study tried to predict long-term vaccination intention, but even a strong intention does not always ensure actual target behaviour in the future. There is often an "intention-behaviour gap" (ScienceDirect, 2019) to overcome, although it is reasonable to expect that intention measures indeed predict actual behaviours (Sheeran, 2002).

From the key findings and shortcomings of this study, the researcher proposed several

suggestions. Concerning CBc's passive impacts particularly on vaccination, there are two plausible pathways to combat them in the perspective of scientific communication. One is debunking via fact-focused communication and the other is prebunking to increase people's protecting attitudes from conspiratorial persuasion (Bavel et al., 2020). Meanwhile, raising people's moral norm of vaccination plays a meaningful role. Authorities such as governments, policymakers, and public health specialists can utilize this point while communicating to the public on the mass media to motivate more people to vaccinate to control the pandemic.

Table 1

Means, standard deviations, and bivariate correlations of variables

	Descriptives		Pearson correlation matrix																	
	M	SD	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Age (1)	25.88	3.61																		
Sex (2)	1.59	.49	.08																	
Location (3)	1.17	.56	-.21*	-.16																
Educational level (4)	2.28	.58	.18*	.08	-.06															
Job experience in healthcare (5)	.28	.45	.12	.01	.09	.07														
Exposure to social media (6)	2.25	1.26	-.04	.08	-.13	-.10	-.08													
Broader exposure to mainstream media (7)	1.23	1.41	.02	.16	-.11	-.03	-.01	.06												
Endorsement of CBc (8)	2.65	.96	-.26**	-.20*	.11	-.12	-.04	-.11	-.10											
Susceptibility (9)	24.85	27.01	-.23**	-.09	.26**	-.01	-.09	-.03	-.21*	.25**										
Severity (10)	1.76	1.07	-.04	.15	.06	.04	-.08	.02	-.01	.06	-.01									
Fear of COVID-19 (11)	1.53	1.35	-.07	.12	.06	.28**	-.11	.03	-.01	.15	-.33**	.30**								
Fear of needles (12)	.78	.96	-.04	.30**	-.06	.20*	.03	.08	.02	.20*	-.01	.36**	.40**							
Fear of healthcare (13)	.49	.69	-.11	-.01	.17*	.01	.07	.08	.01	.18*	.11	.26**	.24**	.38**						
Self-efficacy (14)	2.66	.71	.11	-.02	-.22**	.12	.20*	.15	.13	-.12	-.17*	-.02	.05	.00	-.07					
Effectiveness of vaccines (15)	66.75	26.63	.04	-.18*	-.16	.08	.06	.21*	-.09	-.15	-.11	.09	-.10	-.20*	-.13	.11				
Seriousness of side-effects (16)	.62	.97	-.17*	.10	.08	.14	.10	-.02	.06	.35**	.13	.12	.34**	.37**	.08	-.04	-.23**			
Subjective norm (17)	3.33	1.13	.04	-.02	-.17*	.29**	.07	.16	-.01	.00	-.10	.21*	.10	.15	.03	.17*	.19*	-.05		
Moral norm (18)	3.27	1.20	.05	-.11	-.15	.02	-.16	.16	-.03	-.26**	-.10	.06	-.03	-.15	-.04	.17*	.32**	-.48**	.42**	
Long-term vaccination intention (19)	2.87	1.27	.14	-.13	-.08	.00	-.01	.01	-.02	-.18*	.02	.08	.00	-.18*	-.06	.27**	.32**	-.30**	.35**	.60**

Note. *p < .05. **p < .01.

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Appendix A

Three Language Versions of the Qualtrics Survey

First of all, thanks for the help of Lee, a doctoral student in psychology from the University of Groningen. She has multiple experiences with Chinese and English translation of questionnaires, which benefits particularly to the traditional Chinese version of my survey.

English version

Introduction and informed consent

Hello! Thank you for your interest in our online survey. We are curious about your opinions on COVID-19 and your intention toward long-term vaccination. After providing informed consent at the end of this page, you will first receive some general questions about your background, your experience related to COVID-19 and your exposure to the mass media. Then, questions on various aspects of the COVID-19 pandemic. When you have finished answering our questionnaire, you will be asked to provide your email address for a chance to win one of three electronic gift cards of €50 euros (approximately 200 participants). Lastly, you are referred to a fact check as the end of the survey. In all, this survey is estimated to take you no more than 15 minutes, and we prefer you to answer in your first language.

We always concern your data privacy. All your data will be processed according to guidelines of the University of Groningen. The research plan for our study has been approved by the Psychology Ethics Committee. The research realization will start in February, 2022 and end on 15th April, 2022. Your anonymized data may be used for scientific publication and for educational purposes, but it will never be traceable back to you as a person. Only your IP and e-mail address will be temporarily stored (only available to the principle investigator) to ensure the independence of the data or to allow you to compete for a prize. Within 1 month after completing this research (before 15th May, 2022), this data will be removed from the secure University of Groningen server and from the Qualtrics cloud. Until

then, you can ask us to withdraw your data.

You can always ask questions about the research: now, during the research, or afterwards. You can do so by contacting the principal investigator, Prof. Dr. Arie Dijkstra (arie.dijkstra@rug.nl; +31 503638729). Do you have questions or concerns about your rights as a research participant or about the conduct of the research? You may also contact the Ethics Committee of the Faculty of Behavioural and Social Sciences of the University of Groningen: ec-bss@rug.nl. Do you have questions or concerns regarding the handling of your personal data? You may also contact the University of Groningen Data Protection Officer: privacy@rug.nl.

Participation in this research is voluntary. However, your consent is needed. Therefore, please read information above carefully. Ask all the questions you might have. Only afterwards you decide if you want to participate. If you decide not to participate, you do not need to explain why, and there will be no negative consequences for you. You have this right at all times, including after you have consented to participate in the research.

I am 18 plus, I understand all information above and I want to join this survey.

o **Yes (consent and continue)**

o **Not (to end this survey)**

Demographics

1. *[Age]* What is your age? (Text answer)

2. *[Sex]* What is your sex?

   o Male

   o Female

3. *[Location]* Where are you from?

   o Mainland China

- o   Hong Kong

- o   Macao

- o   Taiwan

4.   *[Educational level]* What is your highest educational level that you have achieved?

- o   Less than high school

- o   High school

- o   Bachelor's degree or equivalent

- o   Master's degree or equivalent

- o   Doctor's degree or equivalent

5.   *[Job experience in healthcare]* Do you have experience working in the health care

sector?

- o   Yes, presently

- o   Yes, in the past

- o   No

Personal experience about COVID-19

6.   *[Self-perception of infection]* Have you ever been ill due to the COVID-19 viruses?

- o   Yes

- o   Maybe

- o   No

7.   *[Test history]* Have you ever got tested due to the COVID-19 viruses?

- o   Yes and tested positive

- o   Yes and tested negative

- o   No

8.   *[Perceived infection in others]* Have people around you (e.g., friends, neighbors, close

relatives) ever got tested positive of the COVID-19 viruses?

  o Yes

  o No

  o I have no clues

9. *[Vaccination history]* How many times have you get vaccinated against the COVID-19 pandemic? (Dropdown list)

  - 0

  - 1

  - 2

  - 3

  - 4

  - 5

Exposure to the mass media (display logic applied by Location)

10. *[Social media] [Mainland China]* Through which **social media platforms** do you usually get **information about COVID-19-related issues** (e.g., the viruses, the current situation, people's opinions, hospitals' measurements, government measurements) from the mass media? **You can have multiple choices.**

o WeChat	o Youku
o Weibo	o Tencent Weibo
o Kuaishou	o Little Red Book/Xiaohongshu
o Douyin	o Qzone
o Baidu Tieba	o Douyu
o (not included)	o (not sure)

10. *[Social media] [Hong Kong, Macao or Taiwan]* Through which **social media platforms** do you usually get **information about COVID-19-related issues** (e.g., the viruses, the current situation, people's opinions, hospitals' measurements, government

measurements) from the mass media? **You can have multiple choices.**

- o   YouTube
- o   WhatsApp
- o   Facebook
- o   Instagram
- o   FB messenger
- o   TikTok
- o   (not sure)

- o   WeChat
- o   Twitter
- o   Line
- o   Linkedin
- o   Skype
- o   (not included)

11. *[Information source] [Mainland China]* From which **sources** do you usually get **information about COVID-19-related issues** (e.g., viruses, the current situation, people's opinions, hospitals' measurements, government measurements)? **You can have multiple choices.**

- o   **China Media Group** (CMG; i.e., China Central Television [**CCTV**], China Global Television Network [**CGTN**], China National Radio [**CNR**], China Radio International [**CRI**])

- o   **Regional television** (e.g., Hunan Broadcasting System, Zhejiang Radio and Television Group, Shanghai Media Group, and Phoenix TV)

- o   **Regional radio** (e.g., Henan Traffic Radio [FM 104.1], Beijing Traffic Radio [FM 103.9], and Jiangsu Communication Broadcasting Station [FM 101.1])

- o   **Central newspapers** (e.g., People's Daily, Economic Daily, China Daily, and Guangming Daily)

- o   **Regional newspapers** (e.g., Beijing Daily, Guangzhou Daily, 21st Century Business Herald, and Changsha Evening Newspaper)

- o   **Cover News**

- o   **The Paper**

- o   **Knews**

- o   **Jiemian**

- **Guancha**
- **Caixin**
- (not included)
- (not sure)

11. *[Information source] [Hong Kong]* From which **sources** do you usually get **information about COVID-19-related issues** (e.g., viruses, the current situation, people's opinions, hospitals' measurements, government measurements)? **You can have multiple choices.**

Cable TV / Hong Kong Open TV	HK Economic Times	Wen Wei Po	Bastille Post
Now TV / ViuTV	Ming Pao	AM 730	HK 01
TVB	Oriental Daily News	Headline Daily	Hong Kong Free Press
Commercial Radio HK	Sing Pao Daily News	Lion Rock Daily	Hong Kong In-media
Metro Radio	Sing Tao Daily	Metropolis Daily	Initium Media
Radio Television Hong Kong (RTHK)	South China Morning Post (SCMP)	Sky Post	Passion Times
HK Commercial Daily	Ta Kung Pao	The Standard	Speak Out HK
HK Economic Journal	(not included)	(not sure)	

11. *[Information source] [Macao]* From which **sources** do you usually get **information about COVID-19-related issues** (e.g., viruses, the current situation, people's opinions, hospitals' measurements, government measurements)? **You can have multiple choices.**

- o TDM
- o Macau Cable TV (MCTV)
- o MSTV
- o MASTV
- o Macau Lotus TV
- o Radio Macau
- o Green Village
- o (not included)

- o Macao Daily News
- o Overseas Chinese Journal
- o The Public
- o The Citizen
- o Star Journal
- o Righteousness
- o Today Macau Journal
- o (not sure)

- o New Chinese Macau Journal
- o Hou Kong Daily
- o Macao Evening
- o Macau Times
- o Exmoo News
- o Macau Today
- o Click2Macau

- o Macau Post Daily
- o Macao Daily Times
- o All About Macau Media
- o My Own Post (MOP)
- o Macau Concealers
- o macaopplmedia
- o 520Macau

11. *[Information source] [Taiwan]* From which **sources** do you usually get **information about COVID-19-related issues** (e.g., viruses, the current situation, people's opinions, hospitals' measurements, government measurements)? **You can have multiple choices.**

- o CTV
- o FTV
- o CTI
- o Apple Daily
- o The Strom Media
- o The Reporter

- o TTV
- o TVBS
- o Next TV
- o United Daily News
- o NOWnews
- o Broadcasting Corporation of China (BCC)

- o CTS
- o SET
- o ERATV
- o China Times
- o The News Lens
- o Police Broadcasting Service (Pbs)

- o PTS
- o EBC
- o Liberty Times
- o Economic Daily News
- o Newtalk
- o UFO Radio

- o Best Radio (including Broadcast Entertainment South Taiwan Co., Ltd. and Power Radio Co., Ltd.)
- o Kaosiung Interactive Super Station (KISS Radio)
- o International Community Radio Taipei (ICRT)
- o Asia FM

- o Hitoradio
- o (not included)
- o (not sure)

Endorsement of conspiracy beliefs concerning the coronavirus (CBc)

12. Please choose the degree of your disagreement or agreement toward the following

   statements.

	Strongly disagree	Disagree	Somewhat disagree	Not sure	Somewhat agree	Agree	**Strongly agree**
1. The National Health Commission of China provides misinformation about COVID-19 to the public.	○	○	○	○	○	○	○
2. The COVID-19 was artificially created in labs by the American government for global economic gain.	○	○	○	○	○	○	○
3. The Chinese government hides the truth about COVID-19.	○	○	○	○	○	○	○

	Strongly disagree	Disagree	Somewhat disagree	Not sure	Somewhat agree	Agree	Strongly agree
4. The COVID-19 was deliberately released as a bioweapon by the American government to destabilize China.	○	○	○	○	○	○	○
5. The COVID-19 was artificially created by powerful pharmaceutical companies for financial gain.	○	○	○	○	○	○	○
6. The seriousness of COVID-19 pandemic is consciously exaggerated by the Chinese government.	○	○	○	○	○	○	○
7. The Chinese government controls the mainstream media in your place.	○	○	○	○	○	○	○
8. The COVID-19 was artificially created in labs by the Chinese government to distract the public from certain social policies.	○	○	○	○	○	○	○
9. The mainstream	○	○	○	○	○	○	○

	Strongly disagree	Disagree	Somewhat disagree	Not sure	Somewhat agree	Agree	Strongly agree
media in your place exaggerate the seriousness of the COVID-19 pandemic.							
10. The Chinese government lies about the statistical information on the COVID-19 pandemic.	○	○	○	C	○	○	○

Social cognitive determinants

The COVID-19 viruses most probably will stay in our population. Therefore, it seems that

vaccinations may be needed every year or even every half year. With the following questions,

we continue to explore your opinions on other aspects of COVID-19 and most of them are

toward the next three years.

13. *[Susceptibility]* How high is the chance do you think that you will get ill from the

     COVID-19 viruses **in the next three years**?

	0 10 20 30 40 50 60 70 80 90 100
Chance (%)	━━━━━━━━━━▮━━━━━━━━━━
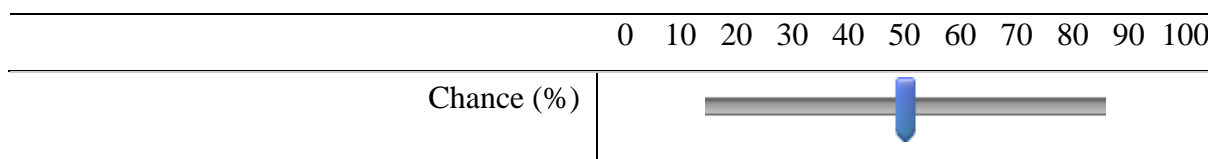
14. *[Severity]* How bad is it do you think to get ill because of the COVID-19 viruses **in the**

     next three years? (Dropdown list)

- (0) Not bad at all

- (1) A little bad

- (2) Just bad

- (3) Very bad

- (4) Awfully bad

15. *[Fear of COVID-19]* Do you feel afraid to get ill because of the COVID-19 viruses **in the next three years**? (Dropdown list)

    - (0) Never

    - (1) Seldom

    - (2) Sometimes

    - (3) Regularly

    - (4) Often

    - (5) Very often

    - (6) Always

16. *[Fear of needles]* How much do you dislike about needles or getting injected in general? (Dropdown list)

    - (0) Not at all

    - (1) A little dislike

    - (2) Just dislike

    - (3) Very dislike

    - (4) Awfully dislike

17. *[Fear of healthcare]* How much do you dislike about seeking help in health care in general? (Dropdown list)

    - (0) Not at all

    - (1) A little dislike

    - (2) Just dislike

    - (3) Very dislike

    - (4) Awfully dislike

18. *[Self-efficacy of disinfection]* Are you able to exert influence yourself on whether you will get contaminated due to the COVID-19 viruses **in the next three years**? (Dropdown
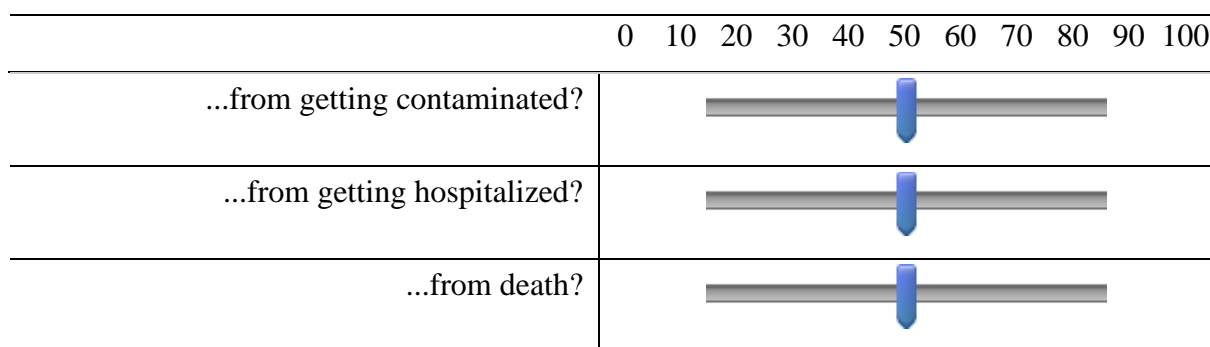
list)

- (0) I have not influence at all.

- (1) I have little influence.

- (2) I do have some influence.

- (3) I have substantial influence.

- (4) I can influence it myself completely.

19. *[Self-efficacy of vaccination]* How easy or difficult for you to get vaccinated in practice

in the next three years? (Dropdown list)

- (0) Very easy

- (1)

- (2)

- (3)

- (4) Very difficult

20. *[Effectiveness of vaccines]* **In the next three years,** in how many of 100 people do you

think will the vaccination protect against the COVID-19 viruses from…

	0 10 20 30 40 50 60 70 80 90 100
...from getting contaminated?	
...from getting hospitalized?	
...from death?	

21. *[Seriousness of side-effects]* How serious do you think the side effects of COVID-19

vaccines could be **in the next three years**? (Dropdown list)

- (0) Very slight

- (1)

- (2)

- (3)

- (4) Very serious

22. *[Subjective norm]* Do **people around you** think that **you should get** vaccinated **in the next three years**? (Dropdown list)

   - (0) Definitely not

   - (1)

   - (2)

   - (3)

   - (4) Definitely

23. *[Moral norm]* Do **you** think it is **your social duty** to get vaccinated **in the next three years**? (Dropdown list)

   - (0) Strongly disagree

   - (1)

   - (2)

   - (3)

   - (4) Strgonly agree (a typo)

Intention and future action

24. *[Intention]* To what extent do you intend to get vaccinated **once or twice a year** against the COVID-19 pandemic **in the next three years**?

   o (0) Not at all

   o (1)

   o (2)

   o (3)

   o (4) Very strongly

25. *[Future action]* How certain are you that you will **actually** get vaccinated **once or twice**

a year against the COVID-19 pandemic **in the next three years**?

- o   (0) Certainly not

- o   (1)

- o   (2)

- o   (3)

- o   (4) Certainly

Email contact

26. Would you like to leave your email address to have a chance for winning one of three

    electronic gift cards? (Text answer)

Fact check

Resources for Fact Check on Misinformation of COVID-19

- 中华人民共和国国家卫生健康委员会. (2021, February 10th). *中国—世界卫生组织新型冠状病毒溯源研究联合专家组新闻发布会实录*. http://www.nhc.gov.cn/cms-search/xxgk/getManuscriptXxgk.htm?id=e7f3cf87b0d04e3a9d1c5cf9137f1f0f

- 事實核查實驗室. (2021, February 19th). *世衛未有公佈「武漢不是病毒起源」*. https://www.factchecklab.org/20210219/

- 台灣事實核查中心. (2020, February 3rd). *【部分錯誤】網傳「中國將承認新冠病毒來自 P4 實驗室」、「多位專家：病毒或來自武漢 P4 實驗室」？*. https://tfc-taiwan.org.tw/articles/2293

- 台灣事實核查中心. (2020, February 10th). *【錯誤】網傳「印度權威科學家證實：類似愛滋病病毒植入新型冠狀病毒，懷疑是中國人工合成的生化武器」？*. https://tfc-taiwan.org.tw/articles/2453

- 台灣事實核查中心. (2020, February 12th). *【錯誤】傳言引述研究指稱「武漢新型冠狀肺炎完全是人造出來的，就是她石正麗造的」？*. https://tfc-

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- European Commission. (n.d.). *Identifying conspiracy theories*. https://ec.europa.eu/info/live-work-travel-eu/coronavirus-response/fighting-disinformation/identifying-conspiracy-theories_en#conspiracy-theories-the-link-to-covid-19

- Andersen, K.G., Rambaut, A., Lipkin, W.I., Holmes, E.C., & Garry, R.F. (2020). The proximal origin of SARS-CoV-2. *Nature Medicine*, 26, 450–452. https://doi.org/10.1038/s41591-020-0820-

Simplified Chinese version

Introduction and informed consent

您好！感谢您对我们的线上调查感兴趣。我们很想知道您对于新型冠状病毒肺炎（以下简称新冠肺炎）的看法，以及您对长期接种新型冠状病毒疫苗（以下简称新冠疫苗）的意向。在本页末端会请你先签下知情同意书，接下来您首先会收到一些问题，是关于您的背景、与新冠肺炎有关的经历以及您对大众媒体的接触。然后是关于新冠肺炎疫情各个方面的问题。当您回答完我们的问卷后，我们会询问您的电子邮件地址，以便有机会参加抽奖赢得一张价值 50 欧元的电子礼品卡（在大约 200 名研究参与者中抽出三名）。最后，在问卷调查的结尾你会看到事实查核（Fact Check）的页面。整体而言，这项调查估计不会占用您超过 15 分钟的时间，以及，我们希望您能用您的母语来完成调查。

我们非常在意您的资料隐私。您的所有数据都将按照格罗宁根大学（The University of

Groningen）的准则进行处理。我们的研究计划已经得到了心理学伦理委员会的批准。

研究将于 2022 年 2 月开始，2022 年 4 月 15 日结束。您的匿名数据可能会被用于科学出版和教育目的，但它永远不会被追溯到您本人。只有您的 IP 地址和电子邮件地址将被暂时保存（只有主要研究者可读取），以确保数据的独立性或让您参加抽奖。在完成这项研究后的一个月内（即 2022 年 5 月 15 日前），这些数据将从格罗宁根大学的安全服务器和 Qualtrics 云端中删除。在那之前，您可以要求我们撤除您的数据。

您可以随时（在现在、调查期间或之后）询问有关研究的问题。为此，您可以咨询主要研究者 Arie Dijkstra 教授（arie.dijkstra@rug.nl；+31 503638729）。如果您对自己作为研究参与者的权利或对研究的进行有疑问或担忧，您也可以联系格罗宁根大学行为与社会科学学院的伦理委员会：ec-bss@rug.nl。若您对您个人数据的处理有疑问或担忧，您也可以联系格罗宁根大学的资料保护人员：privacy@rug.nl。

参与这项研究属于自愿性质。但是，我们还是需要您的同意。因此，请仔细阅读上述信息，提出您可能有的所有问题，之后您才决定是否要参与。如果您决定不参加，您不需要解释原因，这也不会对您产生任何负面影响。您在任何时候都有这个权利，包括在您同意参与研究之后。

我是 18 岁以上，我明白以上所有信息，以及我想要参加这次调查。

○ **是（同意及继续）**

○ **否（结束本次调查）**

Demographics

1. 您的年龄是？（文本框）

2. 您的生理性别是？

○ 男

○　女

3. 您来自哪个地方?

　　○　中国大陆

　　○　香港

　　○　澳门

　　○　台湾

4. 您的最高教育程度是什么？

　　○　低于高中

　　○　高中学历

　　○　大学本科及其同等学历

　　○　硕士学历及其同等学历

　　○　博士学历及其同等学历

5. 您是否有在医疗保健行业的工作经历？

　　○　有，目前是

　　○　有，以前有

　　○　否

Personal experience about COVID-19

6. 您是否曾经因为新冠病毒而生病？

　　○　是

　　○　可能是

　　○　否

7. 您是否曾经因为新冠病毒而接受过测试？

○ 是，测试结果为阳性

○ 是，测试结果为阴性

○ 否

8. 您周边的人（例如：朋友、邻居、亲近的亲戚）是否曾经被检测出新冠病毒呈阳性反应？

○ 是

○ 否

○ 我不知道

9. 您接种了多少次新冠疫苗来对抗新冠肺炎疫情？（下拉列表）

- 0

- 1

- 2

- 3

- 4

- 5

Exposure to the mass media (display logic applied by Location)

10. *[Mainland China]* 您通常透过哪些**社交媒体平台**从大众媒体上获得**与新冠病毒相关的信息**（如新冠病毒；疫情现状；人们的看法；医院的措施；政府的措施）？**您可以有多个选择。**

○ 微信	○ 百度贴吧
○ 微博	○ （没有包括在内）
○ 快手	○ 优酷
○ 抖音	○ 腾讯微博

- 小红书
- QQ空间

- 斗鱼
- （不确定）

10. *[Hong Kong, Macao or Taiwan]* 您通常透过哪些**社交媒体平台**从大众媒体上获得**与新冠病毒相关的讯息**（如新冠病毒；疫情现状；人们的看法；医院的措施；政府的措施）？**您可以有多个选择。**

- YouTube
- WhatsApp
- 脸书（Facebook）
- Instagram
- FB messenger
- TikTok
- (不确定)
- 微信
- 推特（Twitter）
- Line
- Linkedin
- Skype
- (没有包括在内)

11. *[Mainland China]* 您通常从哪些**信息来源**获得**与新冠病毒相关的信息**（如新冠病毒；疫情现状；人们的看法；医院的措施；政府的措施）？**您可以有多个选择。**

- ○ **中央广播电视总台**（即：中国中央电视台 [CCTV]，中国国际电视台 [CGTN]，中央人民广播电台 [CNR] 和中国国际广播电台 [CRI]）
- ○ **地方广播电视台**（例如：湖南广播电视台，浙江电视台，上海广播电视台和凤凰卫视）
- ○ **地方广播电台**（例如：河南广播电视台交通广播 [FM 104.1]，北京广播电视台交通广播 [FM 103.9] 和江苏人民广播电台交通广播网 [FM 101.1]）
- ○ **中央级报纸**（例如：人民日报，经济日报，中国日报和光明日报）
- ○ **地方级报纸**（例如：北京日报，广州日报，21 世纪经济报道和长沙晚报）
- ○ **封面新闻**
- ○ **澎湃新闻**
- ○ **看看新闻**
- ○ **界面新闻**
- ○ **观察者网**
- ○ **财新**
- ○ （没有包括在内）
- ○ （不确定）

11. *[Hong Kong]* 您通常从哪些**讯息来源**获得**与新冠病毒相关的讯息**（如新冠病毒；疫情现状；人们的看法；医院的措施；政府的措施）？**您可以有多个选择。**

- ○ 有线电视/香港开电视
- ○ 经济日报
- ○ 文汇报
- ○ 巴士的报
- ○ Now TV / ViuTV
- ○ 明报
- ○ AM 730
- ○ 香港 01
- ○ 无线电视（TVB）
- ○ 东方日报
- ○ 头条日报
- ○ Hong Kong Free Press
- ○ 商业电台
- ○ 成报
- ○ 香港仔
- ○ 香港独立媒体
- ○ 新城电台
- ○ 星岛日报
- ○ 都市日报
- ○ 端传媒
- ○ 香港电台（RTHK）
- ○ 南华早报
- ○ 晴报
- ○ 热血时报
- ○ 香港商报
- ○ 大公报
- ○ 英文虎报
- ○ 港人讲地
- ○ 信报
- ○ （没有包括在内）
- ○ （不确定）

11. *[Macao]* 您通常从哪些**讯息来源**获得**与新冠病毒相关的讯息**（如新冠病毒；疫情现状；人们的看法；医院的措施；政府的措施）？**您可以有多个选择。**

○ 澳广视	○ 澳门日报	○ 新华澳报	○ 澳门邮报
○ 澳门有线电视	○ 华侨报	○ 濠江日报	○ 澳门每日时报
○ 澳门卫视新闻台	○ 大众报	○ 澳门晚报	○ 论尽媒体
○ 澳亚卫视	○ 市民日报	○ 澳门时报	○ 自己报
○ 澳门莲花卫视	○ 星报	○ 力报	○ 爱瞒日报
○ 澳门电台	○ 正报	○ 正思今日澳门	○ 澳门人（macaopplmedia）
○ 绿邨电台	○ 现代澳门日报	○ 捷报（Click2Macau）	○ 爱澳门（520Macau）
○ （没有包括在内）	○ （不确定）		

11. *[Taiwan]* 您通常从哪些**讯息来源**获得**与新冠病毒相关的讯息**（如新冠病毒；疫情现状；人们的看法；医院的措施；政府的措施）？**您可以有多个选择。**

○ 中视	○ 台视	○ 华视	○ 公视
○ 民视	○ TVBS	○ 三立	○ 东森
○ 中天	○ 壹电视	○ 年代电视	○ 自由时报
○ 苹果日报	○ 联合报	○ 中国时报	○ 经济日报
○ 风传媒	○ NOWnews 今日新闻	○ The News Lens 关键评论网	○ 新头壳
○ 报导者	○ 中广	○ 警广	○ 飞碟电台
○ 好事联播网（包括港都电台和人人电台/好事989电台）	○ KISS RADIO 大众广播	○ 台北国际社区广播电台（ICRT）	○ 亚洲电台

○ HitFM 联播网   ○ （没有包括在   ○ （不确定）
内）

Endorsement of conspiracy beliefs concerning the coronavirus (CBc)

12. 请选择您对以下说法的同意或不同意的程度。

	强烈不同意	不同意	有点不同意	不确定	有点同意	同意	强烈同意
1. 中国国家卫生健康委员会（卫健委）提供有关新冠肺炎的错误信息给大众。	○	○	○	○	○	○	○
2. 新冠肺炎是美国政府为了全球经济利益而在实验室中人为制造的。	○	○	○	○	○	○	○
3. 中国政府隐瞒了关于新冠肺炎的真相。	○	○	○	○	○	○	○
4. 新冠肺炎是美国政府故意释放的生化武器，以破坏中国的稳定。	○	○	○	○	○	○	○
5. 新冠肺炎是有权势的药物公司为了经济利益而人为制造的。	○	○	○	○	○	○	○
6. 新冠肺炎疫情的严重性被中国政府有意夸大。	○	○	○	○	○	○	○
7. 中国政府控制了您所在地区的主流媒体。	○	○	○	○	○	○	○
8. 新冠肺炎是中国政府在实验室人为制造的，以转移公众对某些	○	○	○	○	○	○	○

	强烈不同意	不同意	有点不同意	不确定	有点同意	同意	强烈同意
社会政策的注意力。							
9. 您所在地区的主流媒体夸大了新冠肺炎疫情的严重性。	○	○	○	○	○	○	○
10. 中国政府在关于新冠肺炎疫情的统计信息上说谎。	○	○	○	○	○	○	○

Social cognitive determinants

新冠病毒很可能会与人共存。因此，人们似乎每一年甚至每半年就可能需要接种新冠疫苗。透过接下来的问题，我们继续探讨您对新冠肺炎其他方面的看法，其中大部分问题是针对未来三年的。

13. 您认为**在未来三年内**您因为新冠病毒而患病的机会有多大？

	0 10 20 30 40 50 60 70 80 90 100
机会(%)	
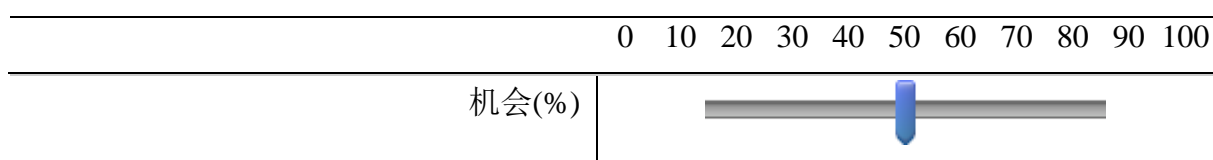
14. 您认为**在未来三年内**因为新冠病毒而患病这件事有多糟糕？（下拉列表）

- (0) 完全不糟糕

- (1) 有点糟糕

- (2) 糟糕

- (3) 很糟糕

- (4) 非常糟糕

15. **在未来三年内**您是否会因为新冠病毒而害怕生病？（下拉列表）

- (0) 从未

- (1) 偶尔

- (2) 有时

- (3) 定期地

- (4) 经常

- (5) 很常

- (6) 总是

16. 一般来说，您对针头或注射的厌恶程度是多少？（下拉列表）

- (0) 完全不厌恶

- (1) 有点厌恶

- (2) 厌恶

- (3) 很厌恶

- (4) 非常厌恶

17. 一般来说，您对求助于医疗保健单位的厌恶程度是多少？（下拉列表）

- (0) 完全不厌恶

- (1) 有点厌恶

- (2) 厌恶

- (3) 很厌恶

- (4) 非常厌恶

18. **在未来三年内**，您是否能影响自身会不会感染到新冠病毒？（下拉列表）

- (0) 我完全没有影响力

- (1) 我有一点点影响力

- (2) 我确实有一些影响力

- (3) 我有很多影响力

- (4) 我完全可以影响我自己

19. 对您来说，**在未来三年内**您实际接种新冠疫苗的难易程度如何？（下拉列表）

- (0) 非常容易

- (1)

- (2)

- (3)

- (4) 非常困难

20. **在未来三年内**，您认为每 100 人中有多少人接种新冠疫苗会起保护作用, 来对抗新

    冠病毒而......？

	0 10 20 30 40 50 60 70 80 90 100
......而不受感染?	
......而不住院?	
...而不死亡?	
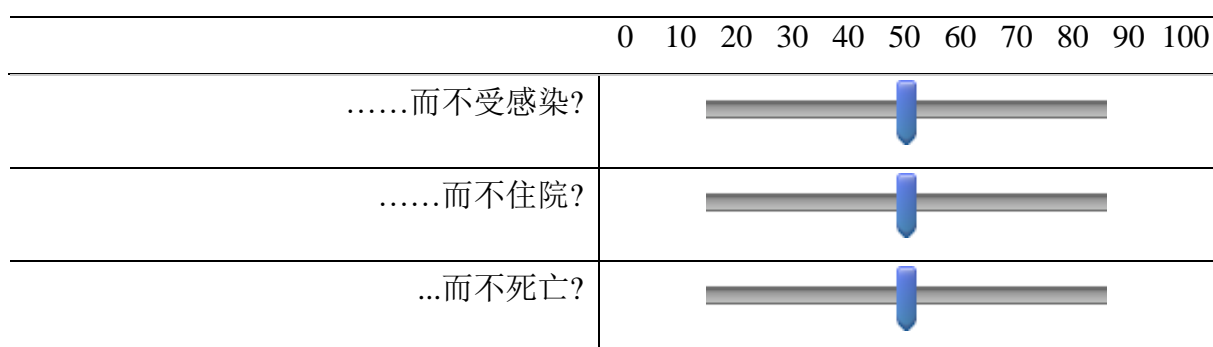
21. 您认为**在未来三年内**新冠疫苗的副作用可能有多严重？（下拉列表）

- (0) 非常轻微

- (1)

- (2)

- (3)

- (4) 非常严重

22. 您**周边的人**是否认为**您应该在未来三年内**接种新冠疫苗？（下拉列表）

- (0) 绝对不会

- (1)

- (2)

- (3)

- (4) 绝对会

23. **您是否认为在未来三年内**接种新冠疫苗是**您的社会责任**？（下拉列表）

  - (0) 强烈不同意

  - (1)

  - (2)

  - (3)

  - (4) 强烈同意

Intention and future action

24. 在多大程度上您想要在未来三年内**每年接种一次或两次**新冠疫苗来对抗新冠肺炎

  疫情?

  ○ (0) 完全没有

  ○ (1)

  ○ (2)

  ○ (3)

  ○ (4) 非常强烈

25. 您有多确定您会**在未来三年内实际地每年接种一次或两次**新冠疫苗来对抗新冠肺

  炎疫情？(In this simplified Chinese version, options of Q25 were presented with

  numbers one larger than other versions', but with my good survey setting, they were

  coded with the same 5-point scale.)

- ○ (1) 当然不会

- ○ (2)

- ○ (3)

- ○ (4)

- ○ (5) 当然会

Email contact

26. 请问您是否愿意留下您的电子邮件地址，以便有机会赢得三张电子礼品卡中的一

张呢？（文本框）

Fact check

关于新冠肺炎错误信息的事实查核（Fact Check）资源

(Exact duplicates are omitted and referred above)

Traditional Chinese version

Introduction and informed consent

您好！感謝您對我們的線上調查感興趣。我們很想知道您對於新型冠狀病毒肺炎（以

下簡稱新冠肺炎）的看法，以及您對長期接種新型冠狀病毒疫苗（以下簡稱新冠疫

苗）的意向。在本頁末端會請你先簽下知情同意書，接下來您首先會收到一些問題，

是關於您的背景、與新冠肺炎有關的經歷以及您對大眾媒體的接觸。然後是關於新冠

肺炎疫情各個方面的問題。當您回答完我們的問卷後，我們會詢問您的電子郵件地

址，以便有機會參加抽獎贏得一張價值 50 歐元的電子禮品卡（在大約 200 名研究參與

者中抽出三名）。最後，在問卷調查的結尾你會看到事實查核（Fact Check）的頁面。

整體而言，這項調查估計不會占用您超過 15 分鐘的時間，以及，我們希望您能用您的

母語來完成調查。

我們非常在意您的資料隱私。您的所有數據都將按照格羅寧根大學（The University of

Groningen）的準則進行處理。我們的研究計劃已經得到了心理學倫理委員會的批准。

研究將於 2022 年 2 月開始，2022 年 4 月 15 日結束。您的匿名數據可能會被用於科學出版和教育目的，但它永遠不會被追溯到您本人。只有您的 IP 地址和電子郵件地址將被暫時保存（只有主要研究者可讀取），以確保數據的獨立性或讓您參加抽獎。在完成這項研究後的一個月內（即 2022 年 5 月 15 日前），這些數據將從格羅寧根大學的安全伺服器和 Qualtrics 雲端中刪除。在那之前，您可以要求我們撤除您的數據。

您可以隨時（在現在、調查期間或之後）詢問有關研究的問題。爲此，您可以諮詢主要研究者 Arie Dijkstra 教授（arie.dijkstra@rug.nl；+31 503638729）。如果您對自己作爲研究參與者的權利或對研究的進行有疑問或擔憂，您也可以聯繫格羅寧根大學行爲與社會科學學院的倫理委員會：ec-bss@rug.nl。若您對您個人數據的處理有疑問或擔憂，您也可以聯繫格羅寧根大學的資料保護人員：privacy@rug.nl。

參與這項研究屬於自願性質。但是，我們還是需要您的同意。因此，請仔細閱讀上述訊息，提出您可能有的所有問題，之後您才決定是否要參與。如果您決定不參加，您不需要解釋原因，這也不會對您產生任何負面影響。您在任何時候都有這個權利，包括在您同意參與研究之後。

我是 18 歲以上，我明白以上所有訊息，以及我想要參加這次調查。

- **是（同意及繼續）**

- **否（結束本次調查）**

Demographics

1. 您的年齡是？（文本框）

2. 您的生理性別是？

   - 男

○ 女

3. 您來自那個地方?

   ○ 中國大陸

   ○ 香港

   ○ 澳門

   ○ 台灣

4. 您的最高教育程度是什麼?

   ○ 低於高中

   ○ 高中學歷

   ○ 大學學歷及其同等學歷

   ○ 碩士學歷及其同等學歷

   ○ 博士學歷及其同等學歷

5. 您是否有在醫療保健行業的工作經歷?

   ○ 有，目前是

   ○ 有，以前有

   ○ 否

Personal experience about COVID-19

6. 您是否曾經因爲新冠病毒而生病?

   ○ 是

   ○ 可能是

   ○ 否

7. 您是否曾經因爲新冠病毒而接受過測試?

○ 是，測試結果為陽性

○ 是，測試結果為陰性

○ 否

8. 您周邊的人（例如：朋友、鄰居、親近的親戚）是否曾經被檢測出新冠病毒呈陽性反應？

○ 是

○ 否

○ 我不知道

9. 您接種了多少次新冠疫苗來對抗新冠肺炎疫情？（下拉列表）

- 0

- 1

- 2

- 3

- 4

- 5

Exposure to the mass media (display logic applied by Location)

10. *[Mainland China]* 您通常透過哪些**社交媒體平台**從大眾媒體上獲得**與新冠病毒相關的信息**（如新冠病毒；疫情現狀；人們的看法；醫院的措施；政府的措施）？**您可以有多個選擇。**

○ 微信   ○ 優酷

○ 微博   ○ 騰訊微博

○ 快手   ○ 小紅書

○ 抖音   ○ QQ 空間

o 百度貼吧   o 鬥魚

o （沒有包括在內）   o （不確定）

10. *[Hong Kong, Macao or Taiwan]* 您通常透過哪些**社交媒體平台**從大眾媒體上獲得**與新冠病毒相關的訊息**（如新冠病毒；疫情現狀；人們的看法；醫院的措施；政府的措施）？ **您可以有多個選擇。**

o YouTube

o WhatsApp

o 臉書（Facebook）

o Instagram

o FB messenger

o TikTok

o （不確定）

o 微信

o 推特（Twitter）

o Line

o Linkedin

o Skype

o （沒有包括在內）

11. *[Mainland China]* 您通常從哪些**信息來源**獲得**與新冠病毒相關的信息**（如新冠病毒；疫情現狀；人們的看法；醫院的措施；政府的措施）？**您可以有多個選擇。**

- ○ **中央廣播電視總台**（即：中國中央電視台 [**CCTV**]，中國國際電視台 [**CGTN**]，中央人民廣播電台 [**CNR**] 和中國國際廣播電台 [**CRI**]）
- ○ **地方廣播電視台**（例如：湖南廣播電視台，浙江電視台，上海廣播電視台和鳳凰衛視）
- ○ **地方廣播電台**（例如：河南廣播電視台交通廣播 [FM 104.1]，北京廣播電視台交通廣播 [FM 103.9] 和江蘇人民廣播電台交通廣播網 [FM 101.1]）
- ○ **中央級報紙**（例如：人民日報，經濟日報，中國日報和光明日報）
- ○ **地方級報紙**（例如：北京日報，廣州日報，21 世紀經濟報導和長沙晚報）
- ○ **封面新聞**
- ○ **澎湃新聞**
- ○ **看看新聞**
- ○ **界面新聞**
- ○ **觀察者網**
- ○ **財新**
- ○ （沒有包括在內）
- ○ （不確定）

11. *[Hong Kong]* 您通常從哪些**訊息來源**獲得**與新冠病毒相關的訊息**（如新冠病毒；疫情現狀；人們的看法；醫院的措施；政府的措施）？**您可以有多個選擇。**

- ○ 有綫電視/香港開電視
- ○ 經濟日報
- ○ 文匯報
- ○ 巴士的報
- ○ Now TV / ViuTV
- ○ 明報
- ○ AM 730
- ○ 香港 01
- ○ 無綫電視（TVB）
- ○ 東方日報
- ○ 頭條日報
- ○ Hong Kong Free Press
- ○ 商業電台
- ○ 成報
- ○ 香港仔
- ○ 香港獨立媒體
- ○ 新城電台
- ○ 星島日報
- ○ 都市日報
- ○ 端傳媒
- ○ 香港電台（RTHK）
- ○ 南華早報
- ○ 晴報
- ○ 熱血時報
- ○ 香港商報
- ○ 大公報
- ○ 英文虎報
- ○ 港人講地
- ○ 信報
- ○ （沒有包括在內）
- ○ （不確定）

11. *[Macao]* 您通常從哪些**訊息來源**獲得**與新冠病毒相關的訊息**（如新冠病毒；疫情

現狀；人們的看法；醫院的措施；政府的措施）？**您可以有多個選擇。**

- ○ 澳廣視
- ○ 澳門日報
- ○ 新華澳報
- ○ 澳門郵報
- ○ 澳門有線電視
- ○ 華僑報
- ○ 濠江日報
- ○ 澳門每日時報
- ○ 澳門衛視新聞台
- ○ 大眾報
- ○ 澳門晚報
- ○ 論盡媒體
- ○ 澳亞衛視
- ○ 市民日報
- ○ 澳門時報
- ○ 自己報
- ○ 澳門蓮花衛視
- ○ 星報
- ○ 力報
- ○ 愛瞞日報
- ○ 澳門電台
- ○ 正報
- ○ 正思今日澳門
- ○ 澳門人（macaopplmedia）
- ○ 綠邨電台
- ○ 現代澳門日報
- ○ 捷報（Click2Macau）
- ○ 愛澳門（520Macau）
- ○ （沒有包括在內）
- ○ （不確定）

11. *[Taiwan]* 您通常從哪些**訊息來源**獲得**與新冠病毒相關的訊息**（如新冠病毒；疫情

現狀；人們的看法；醫院的措施；政府的措施）？**您可以有多個選擇。**

- ○ 中視
- ○ 台視
- ○ 華視
- ○ 公視
- ○ 民視
- ○ TVBS
- ○ 三立
- ○ 東森
- ○ 中天
- ○ 壹電視
- ○ 年代電視
- ○ 自由時報
- ○ 蘋果日報
- ○ 聯合報
- ○ 中國時報
- ○ 經濟日報
- ○ 風傳媒
- ○ NOWnews 今日新聞
- ○ The News Lens 關鍵評論網
- ○ 新頭殼
- ○ 報導者
- ○ 中廣
- ○ 警廣
- ○ 飛碟電台
- ○ 好事聯播網（包括港都電台和人人電台/好事 989 電台）
- ○ KISS RADIO 大眾廣播
- ○ 台北國際社區廣播電台（ICRT）
- ○ 亞洲電台

o HitFM 聯播網　 o 　（沒有包括在　 o 　（不確定）
內）

Endorsement of conspiracy beliefs concerning the coronavirus (CBc)

12. 請選擇您對以下説法的同意或不同意的程度。

	強烈不同意	不同意	有點不同意	不確定	有點同意	同意	強烈同意
1. 中國國家衛生健康委員會（衛健委）提供有關新冠肺炎的錯誤訊息給大衆。	○	○	○	○	○	○	○
2. 新冠肺炎是美國政府爲了全球經濟利益而在實驗室中人爲製造的。	○	○	○	○	○	○	○
3. 中國政府隱瞞了關於新冠肺炎的真相。	○	○	○	○	○	○	○
4. 新冠肺炎是美國政府故意釋放的生化武器，以破壞中國的穩定。	○	○	○	○	○	○	○
5. 新冠肺炎是有權勢的藥物公司爲了經濟利益而人爲製造的。	○	○	○	○	○	○	○
6. 新冠肺炎疫情的嚴重性被中國政府有意誇大。	○	○	○	○	○	○	○
7. 中國政府控制了您所在地區的主流媒體。	○	○	○	○	○	○	○
8. 新冠肺炎是中國政府在實驗室人爲製造的，以轉移公衆對某些	○	○	○	○	○	○	○

	強烈不同意	不同意	有點不同意	不確定	有點同意	同意	強烈同意
社會政策的注意力。							
9. 您所在地區的主流媒體誇大了新冠肺炎疫情的嚴重性。	○	○	○	○	○	○	○
10. 中國政府在關於新冠肺炎疫情的統計訊息上說謊。	○	○	○	○	○	○	○

Social cognitive determinants

新冠病毒很可能會與人共存。因此，人們似乎每一年甚至每半年就可能需要接種新冠疫苗。透過接下來的問題，我們繼續探討您對新冠肺炎其他方面的看法，其中大部分問題是針對未來三年的。

13. 您認爲**在未來三年内**您因爲新冠病毒而患病的機會有多大？

	0 10 20 30 40 50 60 70 80 90 100
機會(%)	▬▬▬▬▬▬▬▬▬▬▬▬
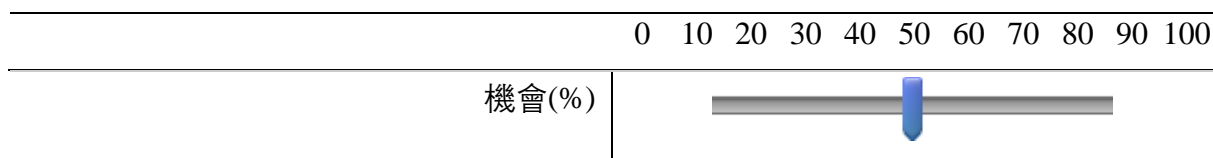
14. 您認爲**在未來三年内**因爲新冠病毒而患病這件事有多糟糕？（下拉列表）

- (0) 完全不糟糕

- (1) 有點糟糕

- (2) 糟糕

- (3) 很糟糕

- (4) 非常糟糕

15. **在未来三年内**您是否会因为新冠病毒而害怕生病？（下拉列表）

- (0) 從未

- (1) 偶爾

- (2) 有時

- (3) 定期地

- (4) 經常

- (5) 很常

- (6) 總是

16. 一般來講，您對針頭或注射的厭惡程度是多少？（下拉列表）

- (0) 完全不厭惡

- (1) 有點厭惡

- (2) 厭惡

- (3) 很厭惡

- (4) 非常厭惡

17. 一般來講，您對求助於醫療保健單位的厭惡程度是多少？（下拉列表）

- (0) 完全不厭惡

- (1) 有點厭惡

- (2) 厭惡

- (3) 很厭惡

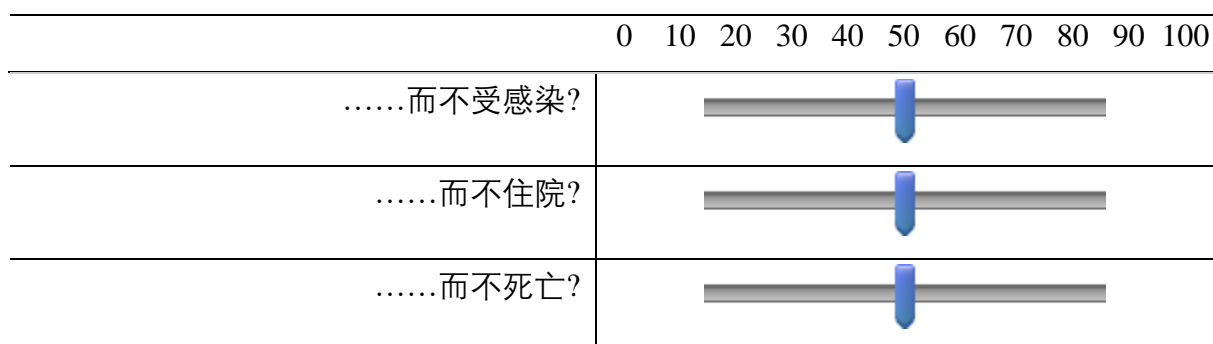- (4) 非常厭惡

18. **在未來三年內**，您是否能影響自身會不會感染到新冠病毒？（下拉列表）

- (0) 我完全沒有影響力

- (1) 我有一點點影響力

- (2) 我確實有一些影響力

- (3) 我有很多影響力

- (4) 我完全可以影響我自己

19. 對您來講，**在未來三年内**您實際接種新冠疫苗的難易程度如何？（下拉列表）

- (0) 非常容易

- (1)

- (2)

- (3)

- (4) 非常困難

20. **在未來三年内**，您認爲每 100 人中有多少人接種新冠疫苗會起保護作用，來對抗

新冠病毒而……？

	0 10 20 30 40 50 60 70 80 90 100
……而不受感染？	
……而不住院？	
……而不死亡？	

21. 您認爲**在未來三年内**新冠疫苗的副作用可能有多嚴重？（下拉列表）

- (0) 非常輕微

- (1)

- (2)

- (3)

- (4) 非常嚴重

22. **您周邊的人**是否認爲**您應該在未來三年内**接種新冠疫苗？（下拉列表）

- (0) 絕對不會

- (1)

- (2)

- (3)

- (4) 絕對會

23. **您是否認爲在未來三年內**接種新冠疫苗是**您的社會責任**？（下拉列表）

- (0) 強烈不同意

- (1)

- (2)

- (3)

- (4) 強烈同意

Intention and future action

24. 在多大程度上您想要**在未來三年內每年接種一次或兩次**新冠疫苗來對抗新冠肺炎

疫情?

○ (0) 完全沒有

○ (1)

○ (2)

○ (3)

○ (4) 非常強烈

25. 您有多確定您會**在未來三年內實際地每年接種一次或兩次**新冠疫苗來對抗新冠肺

炎疫情?

○ (0) 當然不會

○ (1)

- ○ (2)

- ○ (3)

- ○ (4) 當然會

Email contact

26. 請問您是否願意留下您的電子郵件地址，以便有機會贏得三張電子禮品卡中的一

張呢？（文本框）

Fact check

關於新冠肺炎錯誤信息的事實查核（Fact Check）資源

(Exact duplicates are omitted. Links are referred above)

Appendix B

Partial Work Log of Statistical Analyses

Recoding the variable of educational levels

To re-code the variable about participants' educational levels, I searched for official information about higher education in China (学信网, 2004). From it, the high school level should be the general level as a possible cut-off point, but currently, my data was not nationally representative – it was from a snowball sampling conducted in my social network. Thus, I decided to take the bachelor's degree or equivalent as a more sensible mid-point based on my selected participants. Values of its new variable were labeled as the following: (1) lower, (2) general, and (3) higher.

Participant exclusion

Raw data consists of 267 participants after excluding 15 cases collected from survey previews. However, to filter out missing data, I used a filter function (i.e., NVALID [Q25 >= 0]) to select cases with valid responses on the variable named "Q25" which relates to the last question about future action in my questionnaire. This automatically generated a filter variable. My logic was that with the force response setting in my Qualtric survey, this question can only be met if all previous questions are answered. At this moment, the sample with this filter was downsized to 150.

Concerning double IP addresses, I checked the frequency of its variable and found four pairs of double IP addresses, suggesting that the corresponding four respondents should be excluded. Because of double IP, the responses of these respondents are no longer independent, so within each pair of cases, I kept the first one and delete the second for

randomization. I also deleted two cases with empty IPs. Right now, the sample was further

downsized to 144.

I was also concerned about implausible responses on the age variable that is with text

answers. I checked its frequency and found 8 confusing responses that were one "0", four

"1", one "11", one "298", and one "6". To effectively utilize the current sample, I re-coded

"0", "1", and "298" as missing data, because persons aged 0 and 1 who should be infants

cannot fill in the survey, and a 298-year-old person is impossible. I cannot know why these

respondents answered about their age in such a confusing way. Also, participants of my study

were required to be adults above 18, thus, I deleted cases with answers as "11" and "6" on

age. Right now, the sample was downsized to 142, while 6 cases are missing on the age

variable.

Assumption checks

Generally, the assumption for multiple regression on each hypothetical model was roughly

met. The first model hypothesized CBc as the independent variable and ten determinants as

mediators to predict long-term vaccination intention. The second model hypothesized

exposure to social media as the independent variable and CBc as a mediator to predict long-

term vaccination intention. The third model hypothesized broader exposure to mainstream

media (versus alternative media) as the independent variable and CBc as a mediator to predict

long-term vaccination intention. The fourth model hypothesized exposure to social media as

the independent variable and ten determinants as mediators to predict long-term vaccination

intention. The fifth model hypothesized broader exposure to mainstream media (versus

alternative media) as the independent variable and ten determinants as mediators to predict

long-term vaccination intention.

Given that the Casewise Diagnostics in SPSS highlights any cases whose standardized residual is greater than ±3 standard deviations, thus, an outlier whose case number is 176 was found in the first, the fourth, and the fifth models. I decided to include this outlier in my further mediation analyses because it is possible in the reality that a person indeed has extreme performance in certain social aspects.

Appendix C

Explanation of Media Options in the Qualtrics Survey

In mainland China, Hong Kong, Macao, and Taiwan, the student researcher surveyed participants' exposure to the mass media by discovering their frequently used social media platforms and information sources usually consumed.

For social media platforms, options adopted results of the most-used social media platforms from digital reports in the four regions last year (We Are Social & Hootsuite, 2021a; We Are Social & Hootsuite, 2021b; Kemp, 2021a; Kemp, 2021b). The top 10 of each region were selected, with "not included" and "not sure" as additional. Specifically, option lists for participants from Hong Kong, Macao, and Taiwan were combined into one because they highly overlapped with each other but were different somewhat on rankings, and TikTok was also included based on the researcher's observation.

Information sources of participants were classified into two categories, namely, mainstream media which are old and traditional, controlled by large media organizations (Welsh & Wright, 2010), and alternatives. For mainland China, most options were derived from the Chinese government's resources (CTR China Insight, 2021; 人民网研究院, 2021a; 人民网研究院, 2021b; 人民网研究院, 2021c; Office of the Central Cyberspace Affairs Commission, 2021). According to this classification, media outlets based on television, radio, and newspapers all belong to the mainstream, while The Paper, Knews, Jiemian, Cover News, Caixin, and Guancha are online news media outlets as alternatives.

For Hong Kong, options adopted results in 2019 of the tracking research on public evaluation of media credibility (available with Chinese and English versions; Centre for

Communication and Public Opinion Survey, n.d.). Among the results, media outlets based on television and radio are all mainstream media. Regarding newspapers, AM730 belongs to a relatively less powerful news media outlet, and Sky Post and Lion Rock Daily were founded in and after 2010, thus, they are not belonged to the mainstream, while the rest are. Concerning online news media, all of them are alternatives, while Apple Daily, Hong Kong Citizen News, Post 852, and Stand News were found defunct before research realization, so they were excluded in the current study.

For Macao, options for television, radio, and newspapers were developed from government information (Government Information Bureau, 2021). Similar to the situation in Hong Kong, all media outlets based on television and radio are mainstream media. Regarding newspapers, Chinese weeklies were excluded for their less instant updates, and Portuguese newspapers were also excluded for being less relevant to the research sample; Macao Evening and Exmoo News were founded in and after 2010 so they are alternatives, while the rest belong to the mainstream. Options for online news media were from previous research in local (Lin & Liu, 2019) and all of them are alternatives, however, "澳门良心" was excluded because it cannot be found anymore.

For Taiwan, options on the radio are stations that are more commonly listened to (i-Vision Marketing Consultant, 2019), and options on television, newspapers and the Internet are the most viewed ones in local (Taiwan Media Watch, 2019). Media outlets based on television are all mainstream, except for Next TV as an alternative because it was founded in 2010. Those based on radio and newspapers are all mainstream media, while all online news media are alternatives.